

Figure 1.3: Lift-off processing

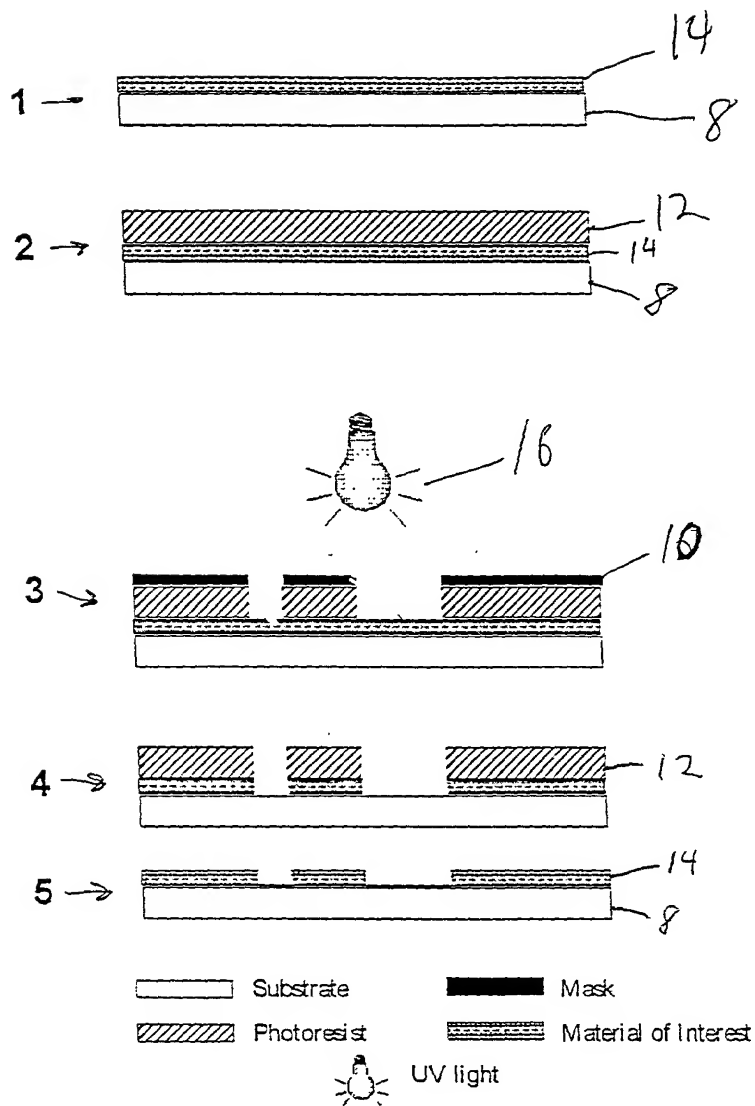


Fig 2

Figure 1.4: Etching procedure

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99
0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99

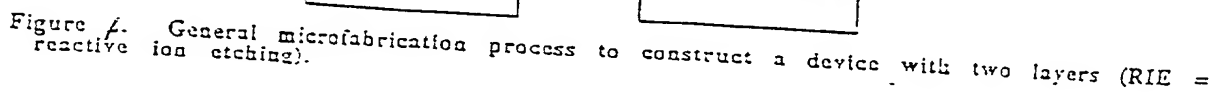


Figure 1. General microfabrication process to construct a device with two layers (RIE = reactive ion etching).

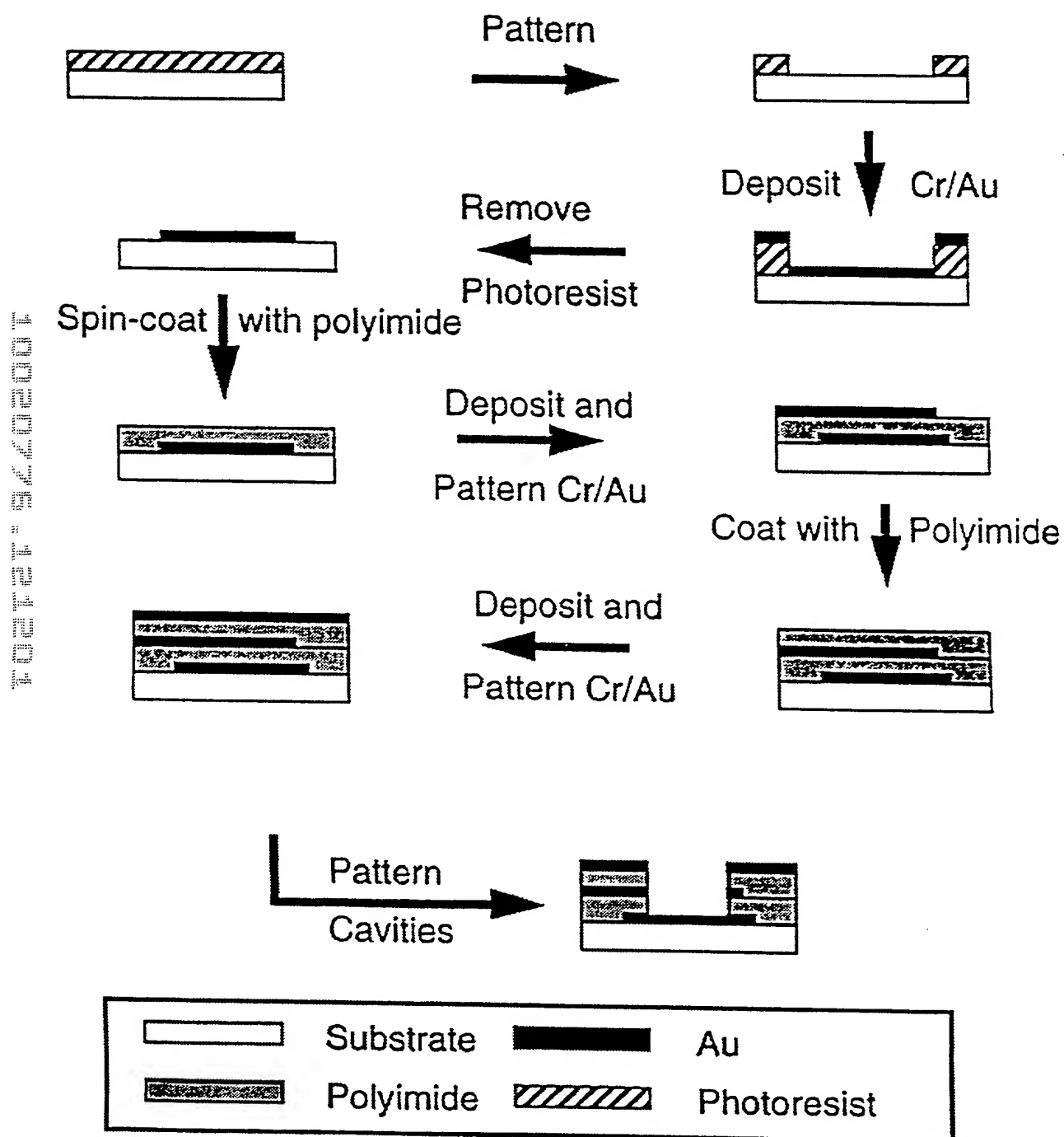
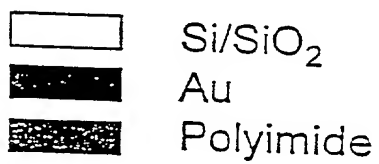
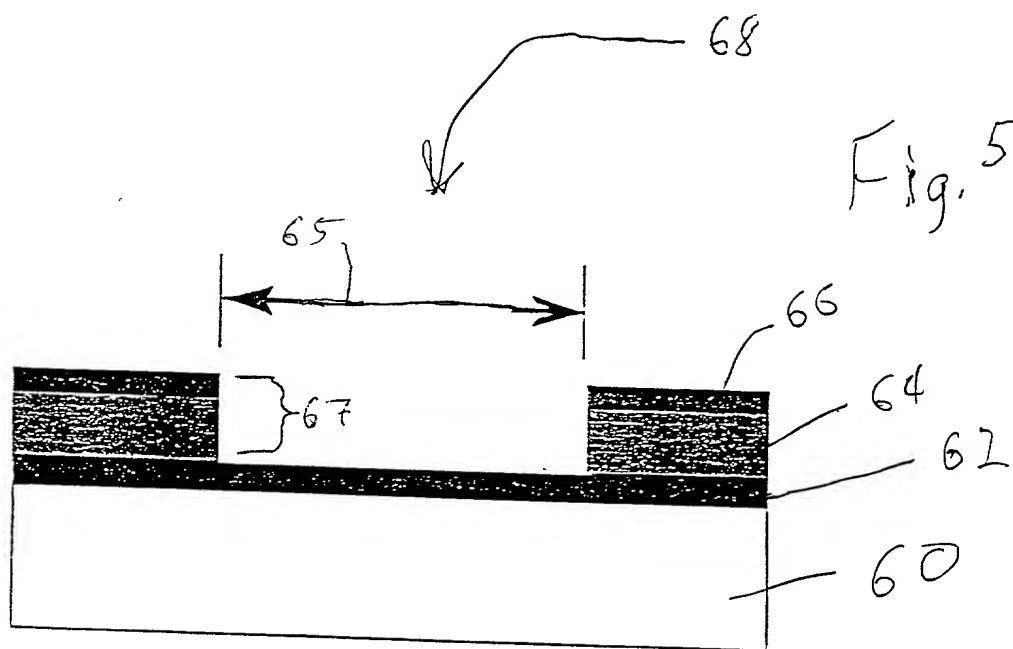


Figure 4. Schematic of the fabrication procedure for the 5-layer microcavity device.

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ation
ssing

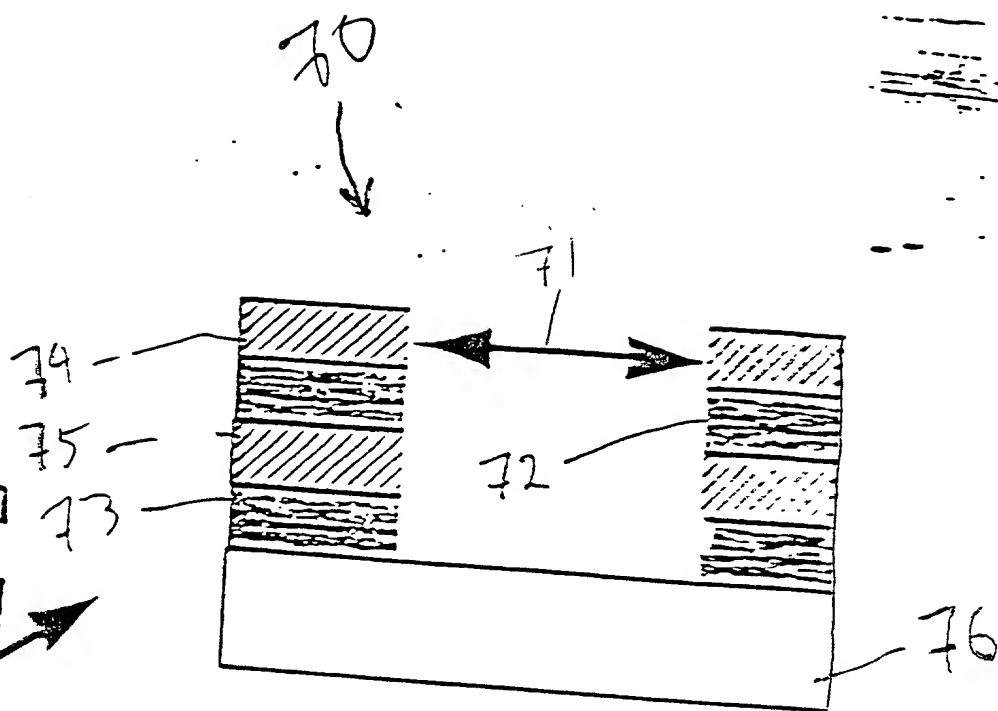


Fig. 6

A Disk and a Band Electrode

ation
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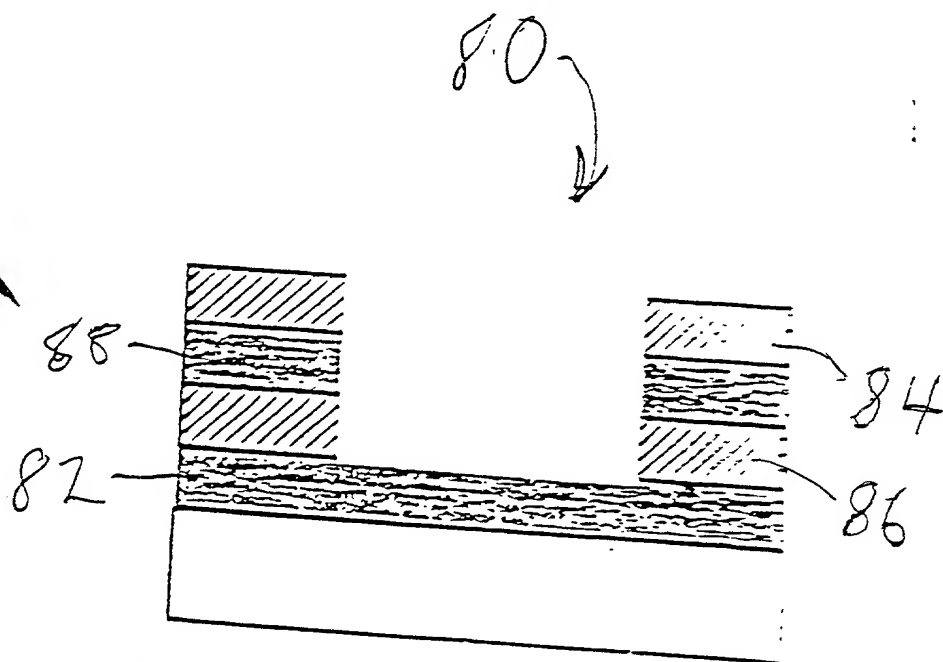
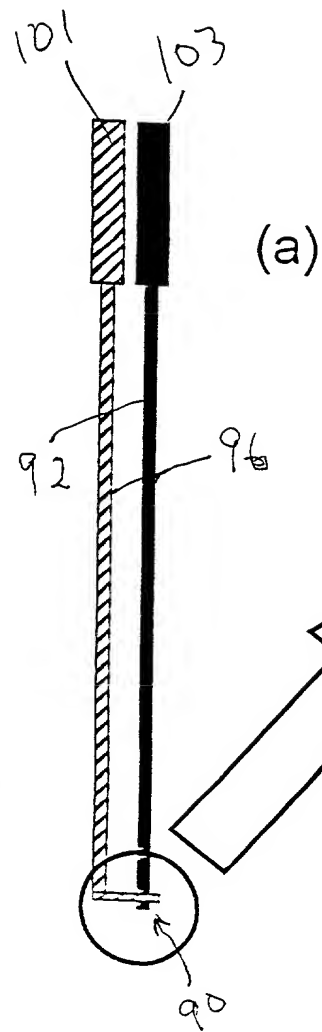


Fig. 7

Two Band Electrodes

$$0.001 \mu\text{m} \leq h \leq 500 \mu\text{m}$$

Fig 9



Figure

Fig 10

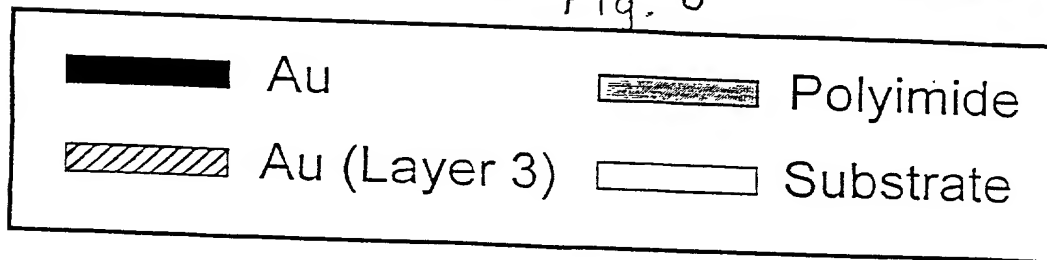
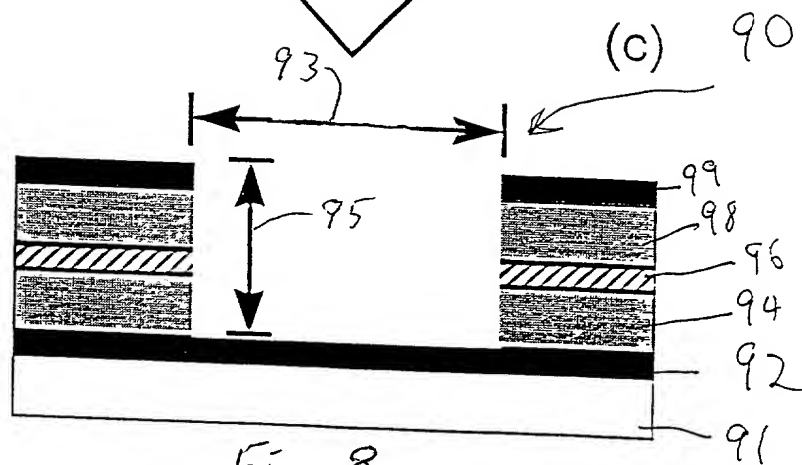
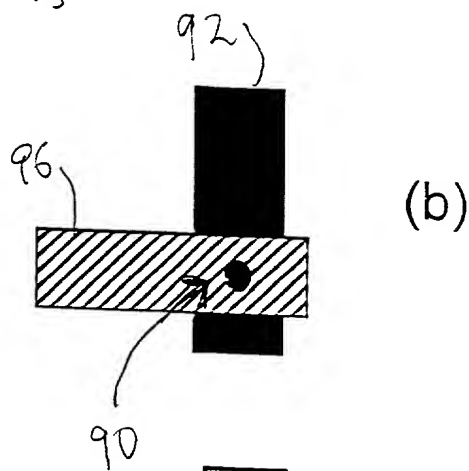
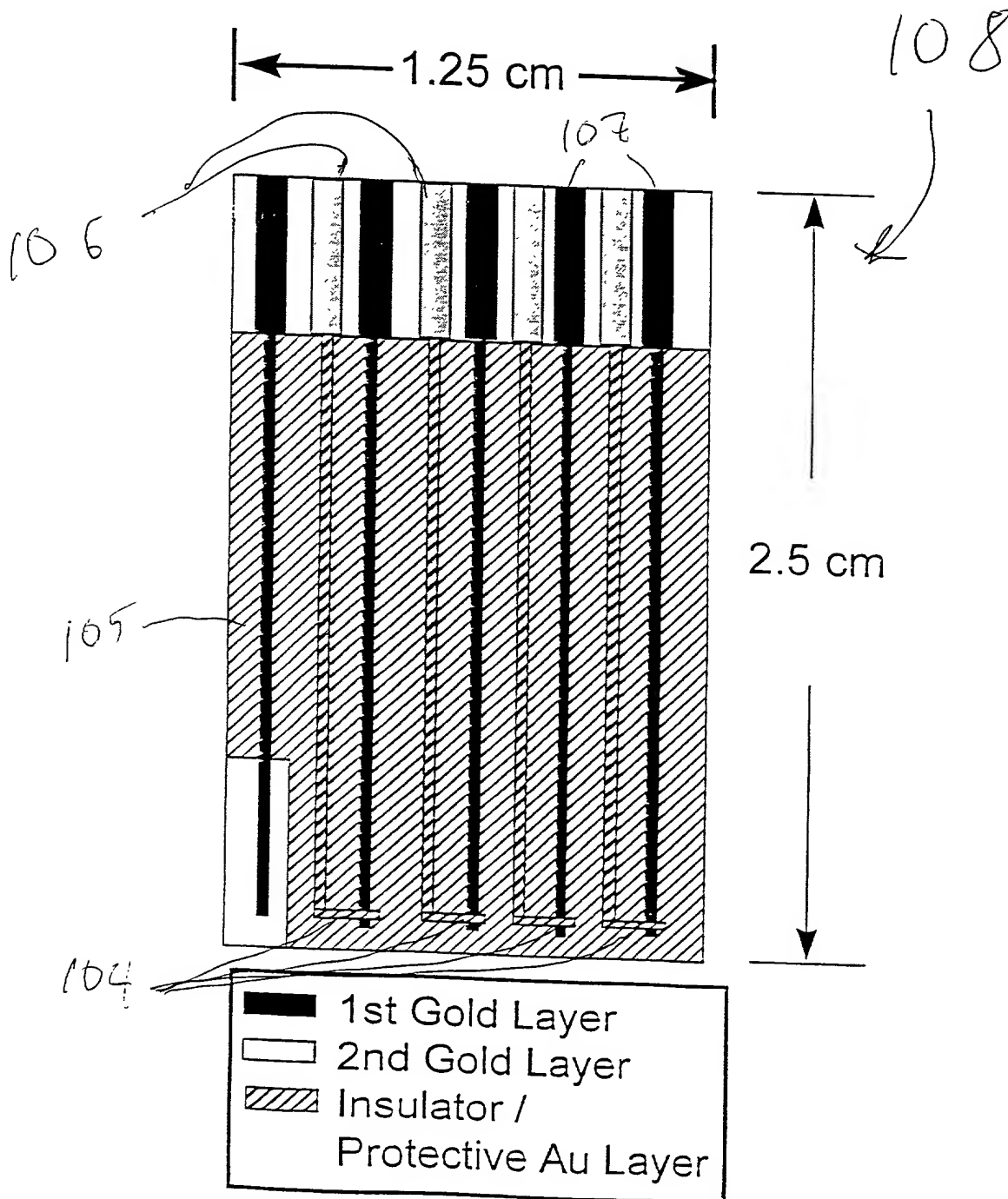
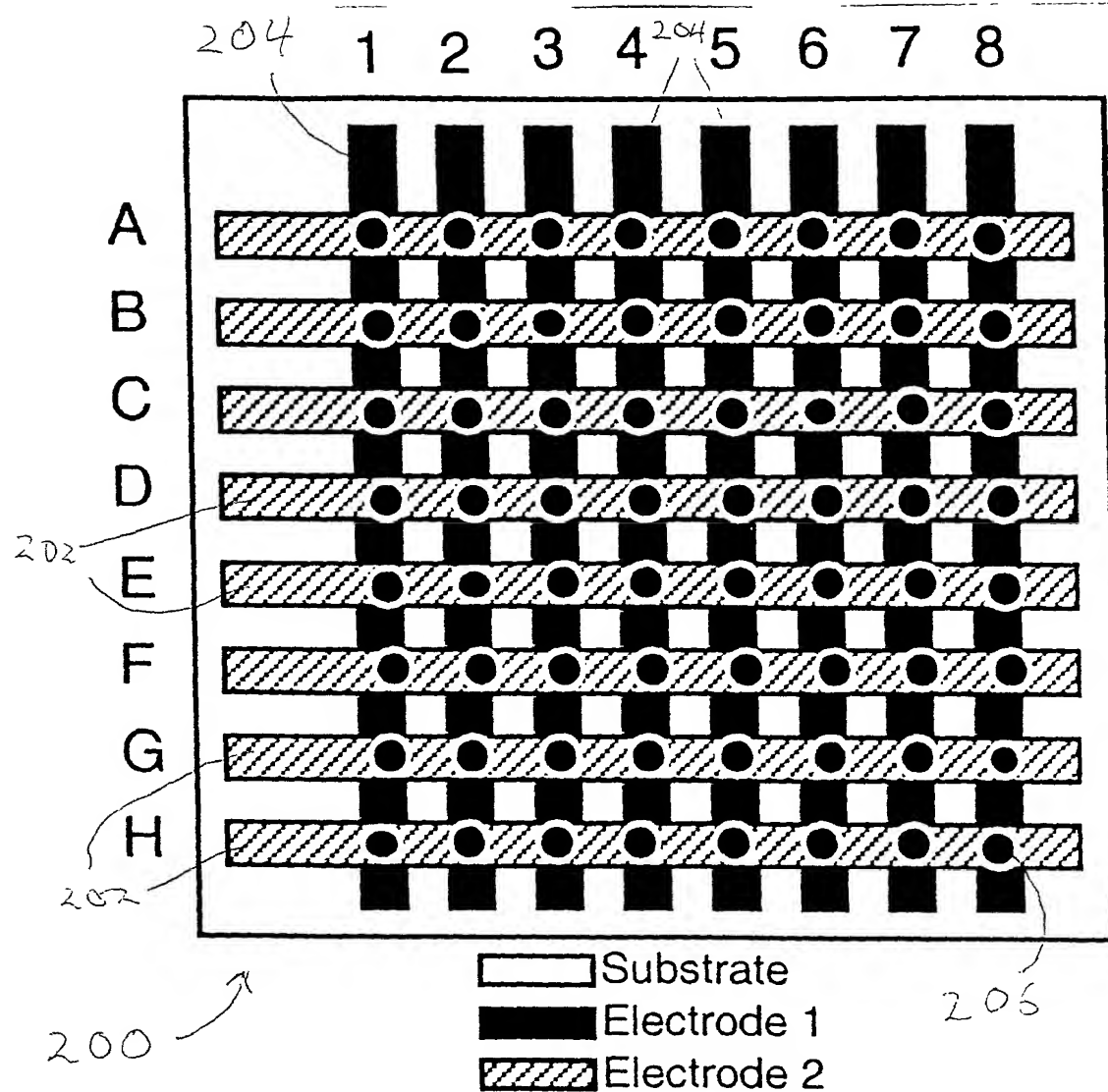


Fig 11



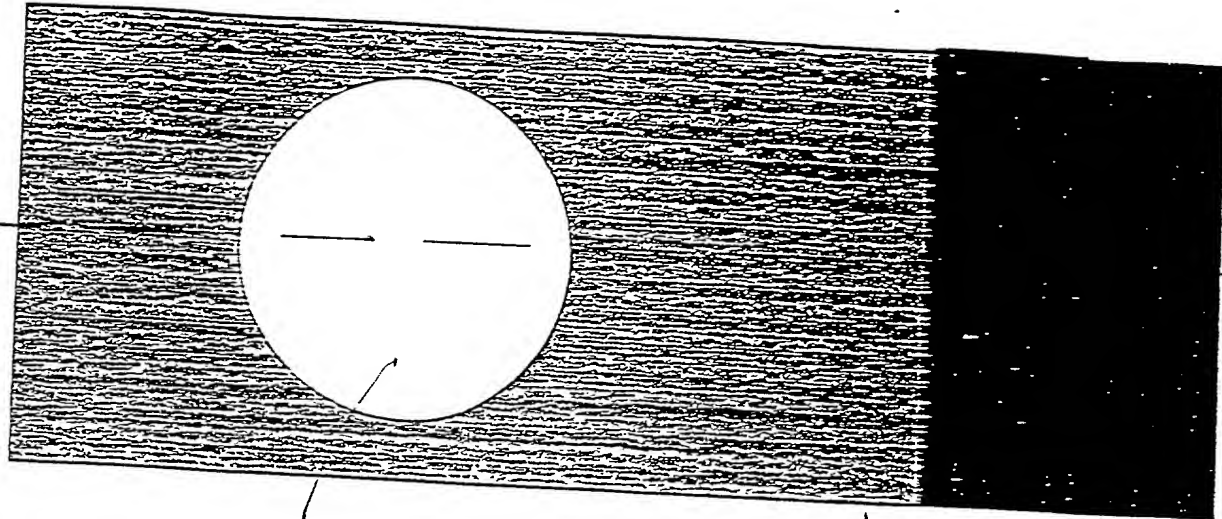


8 array for multi-small volume microelectrochemical analysis.

Fig. 12

Fig. 13

Top View



Cross-sectional View

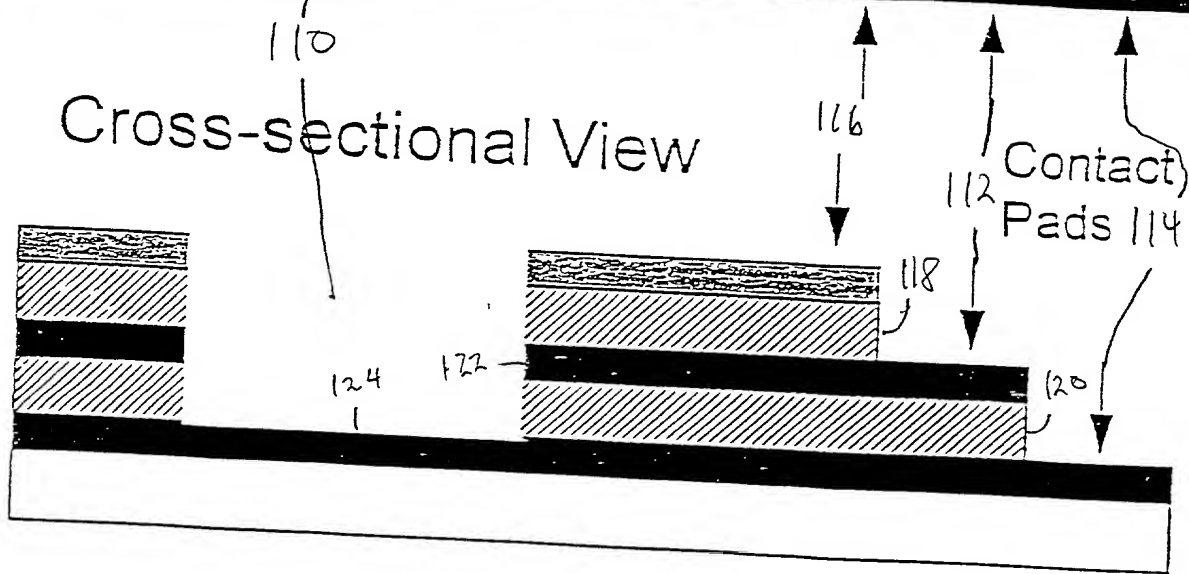


Fig. 14





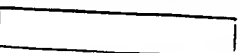
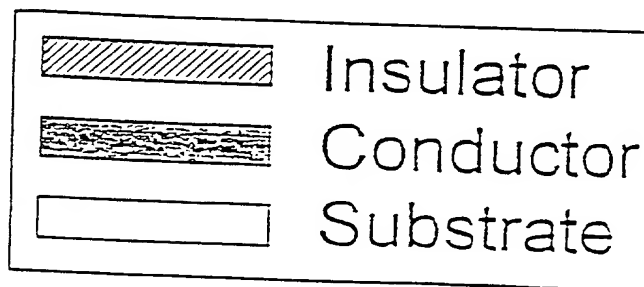
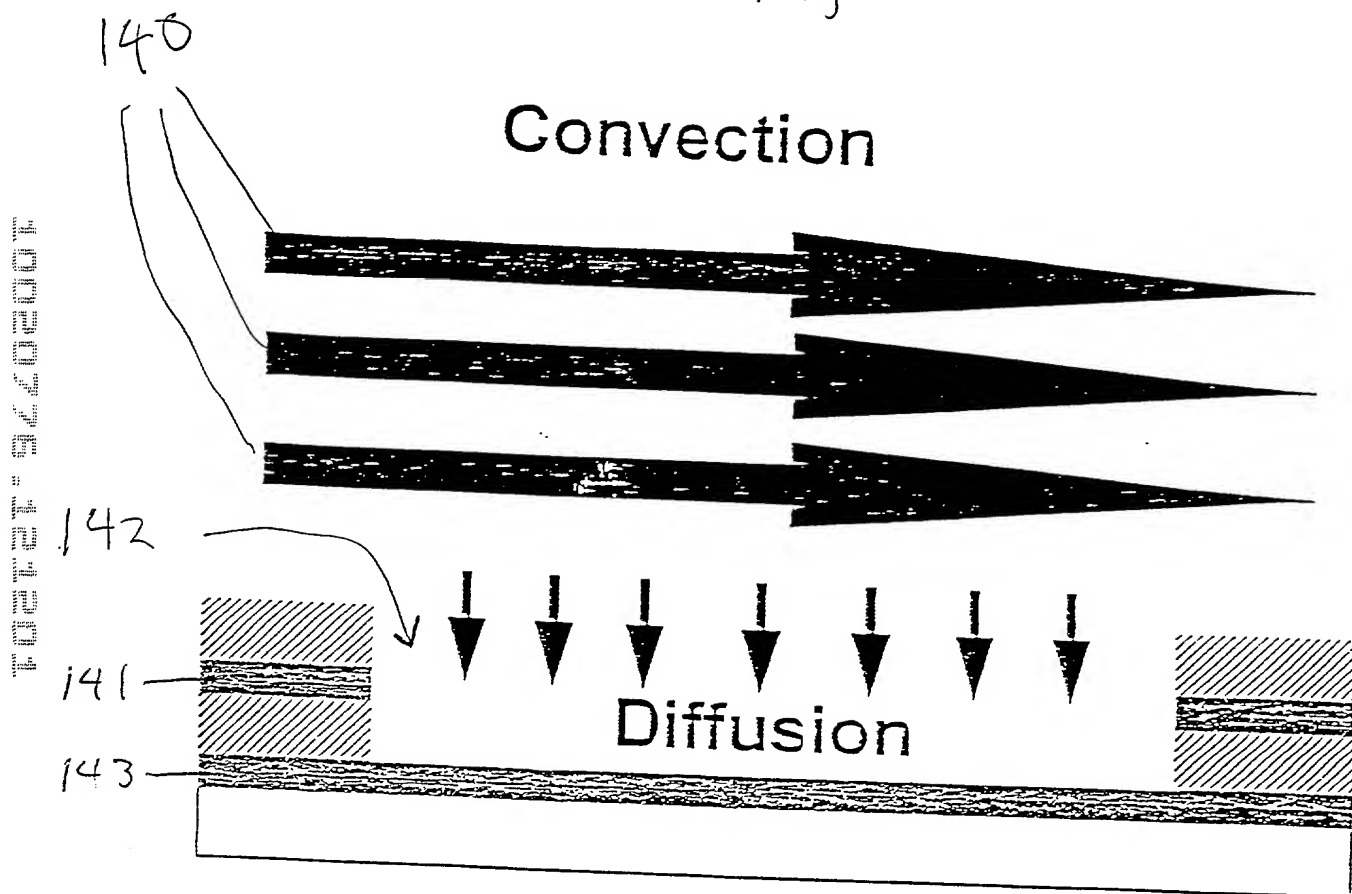
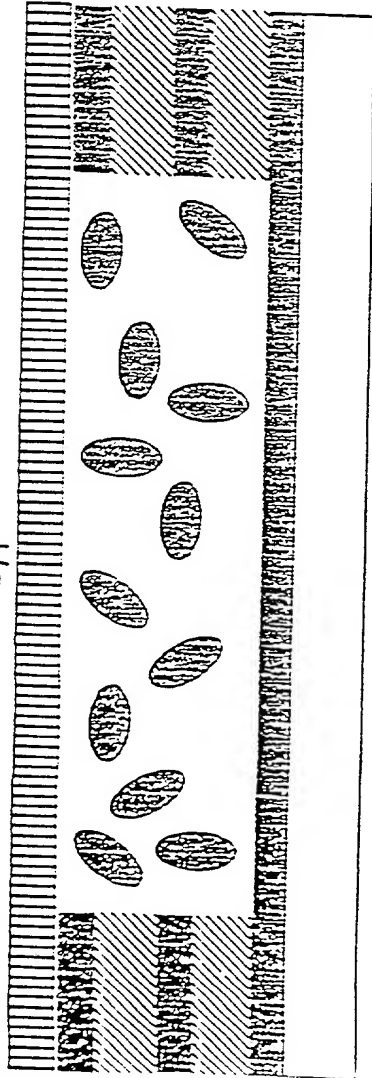
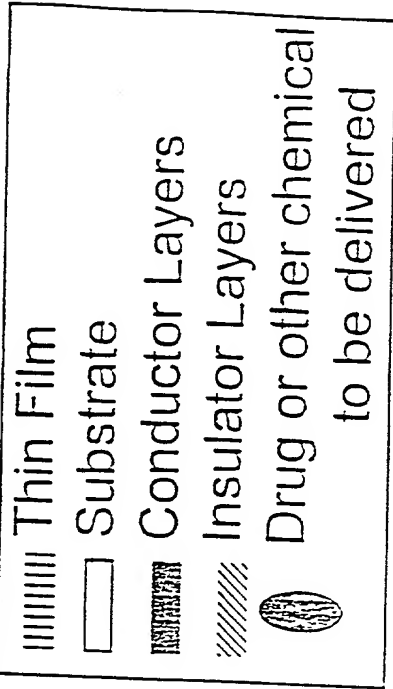
	Insulator Layers
	1st Conductor Layer
	2nd Conductor Layer
	3rd Conductor Layer
	Substrate

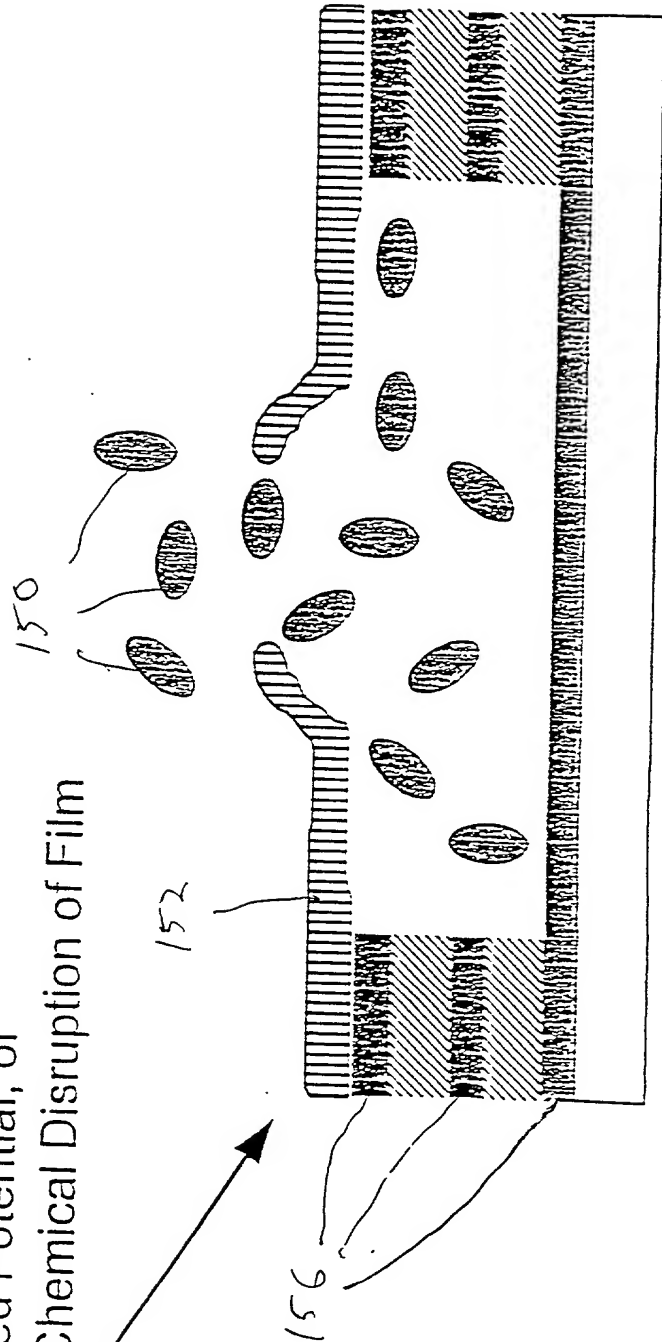
Fig 15



11

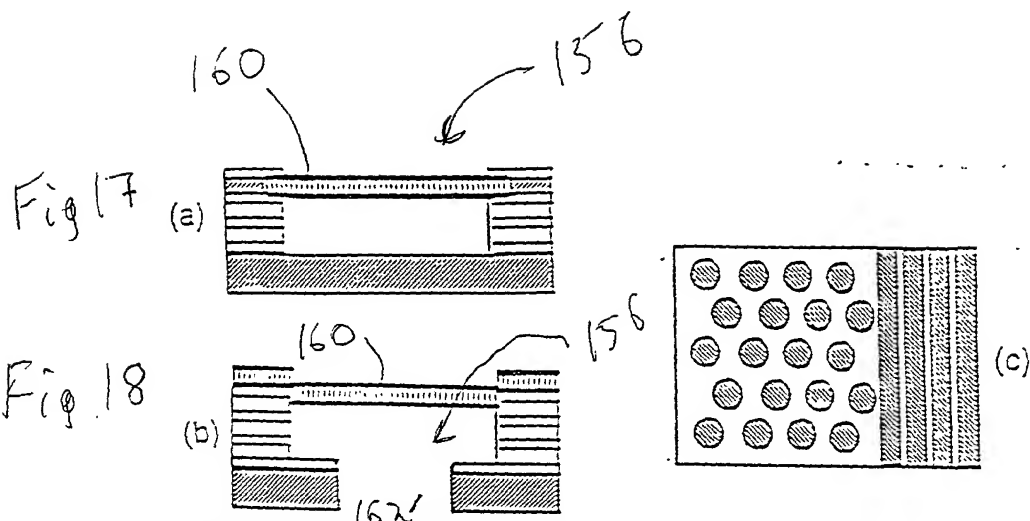


Osmotic Change, or
Applied Potential, or
Chemical Disruption of Film



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Fig. 16



Other possible target structures for three-dimensional microfabricated devices. *On left:* Cross sections with suspended bilayers; Au band electrodes, represented in light gray. (a) Edges of bilayer anchored by alkanethiol-derivatized inner edges of Au layers in an etched region of insulator (white); bottom of well is lined with an insulator layer. (b) Same as Figure 4, but with a hole at its base to minimize osmotic effects (substrate here is Si_3N_4 for this purpose). *On right:* Top view of a multiple-well array. Each circle represents a single cavity ($1\text{ }\mu\text{m}$ to $100\text{ }\mu\text{m}$) over which a bilayer will be assembled. Each contact pad accesses a different level of conductor.

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Fig 19

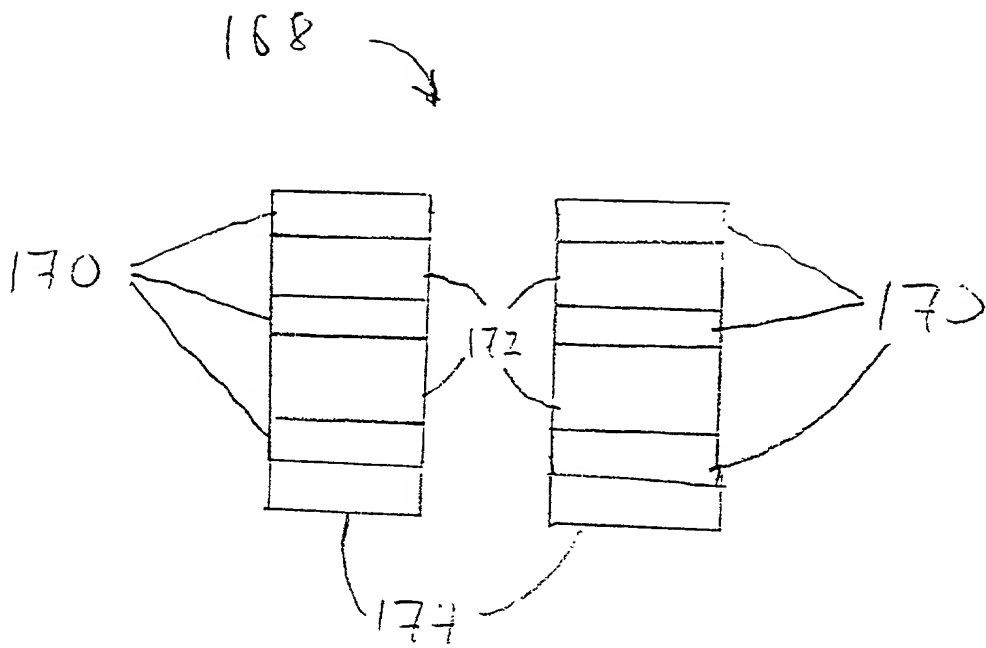


Fig. 20

